

WHAT IS CLAIMED IS:

1. A method of determining structural integrity of a bone within the spine of a patient, the bone having a first aspect and a second aspect, said second aspect separated from said first aspect by a width and located adjacent to a spinal nerve, said method comprising:

applying an electrical stimulus to said first aspect of said bone;

electrically monitoring a muscle myotome associated with said spinal nerve to determine an onset neuro-muscular response to the application of said electrical stimulus to said first aspect of said bone; and

communicating to a user an onset electrical stimulus level which causes said onset neuro-muscular response.

2. The method of claim 1, wherein the electrical stimulus is emitted from an electrode disposed on the distal end of at least one of a probe and surgical tool.

3. The method of claim 1, wherein applying an electrical stimulus comprises applying a plurality of electrical stimulus pulses.

4. The method of claim 3, wherein the plurality of electrical stimulus pulses comprises current pulses that increase over time.

5. The method of claim 3, wherein the plurality of electrical stimulus pulses comprises current pulses that vary incrementally.

6. The method of claim 3, wherein the plurality of electrical stimulus pulses comprises current pulses varied incrementally within a range from 0.5 to 32.0 milliamps.
7. The method of claim 3, wherein said bone is disposed within one of the cervical, thoracic, and lumbar region of the patient's spine.
8. The method of claim 1, wherein said spinal nerve exits from successive vertebrae within one of the cervical, thoracic, and lumbar region of the patient's spine.
9. The method of claim 1, wherein said onset neuro-muscular response is an electromyography response from a muscle coupled to said spinal nerve.
10. The method of claim 1, wherein electrically monitoring said muscle myotome is performed through the use of an electrode electrically coupled to said muscle myotome.
11. The method of claim 1, wherein said muscle myotome is disposed in one of the patient's arms.
12. The method of claim 1, wherein said muscle myotome is disposed in one of the patient's legs.
13. The method of claim 1, wherein said onset neuro-muscular response is determined by assessing whether said neuro-muscular response is greater than a predetermined onset

level and increasing the electrical stimulus until the determined neuro-muscular response is greater than the predetermined onset level.

14. The method of claim 1, wherein communicating to a user includes visually indicating an intensity level of the onset neuro-muscular response for said spinal nerve.

15. The method of claim 14, wherein visually indicating comprises illuminating lights.

16. The method of claim 14, wherein visually indicating comprises illuminating lights of varying colors.

17. The method of claim 16, wherein each color corresponds to a predetermined warning to the user.

18. The method of claim 1 and further, comprising audibly indicating to an operator an intensity level of said onset neuro-muscular response for said spinal nerve.

19. The method of claim 18, wherein audibly indicating comprises sounding an alarm if said onset neuro-muscular response is detected at a predetermined intensity level.

20. The method of claim 18, further comprising varying the volume of said alarm according to said intensity level needed to evoke said onset neuro-muscular response.

21. The method of claim 20, wherein said volume of said alarm decreases as said intensity level needed to evoke a neuro-muscular response increases.
22. The method of claim 21, further comprising varying the frequency of said alarm according to said intensity level needed to evoke said onset neuro-muscular response.
23. The method of claim 22, wherein said frequency of said alarm decreases as said intensity level needed to evoke said onset neuro-muscular response increases.
24. The method of claim 1, wherein said first aspect of said bone comprises a region within a pedicle in contact with a pedicle screw.
25. The method of claim 1, wherein applying an electrical stimulus to said first aspect of said bone comprises applying said electrical stimulus to a proximal end of a bone screw inserted into said first aspect of said bone.